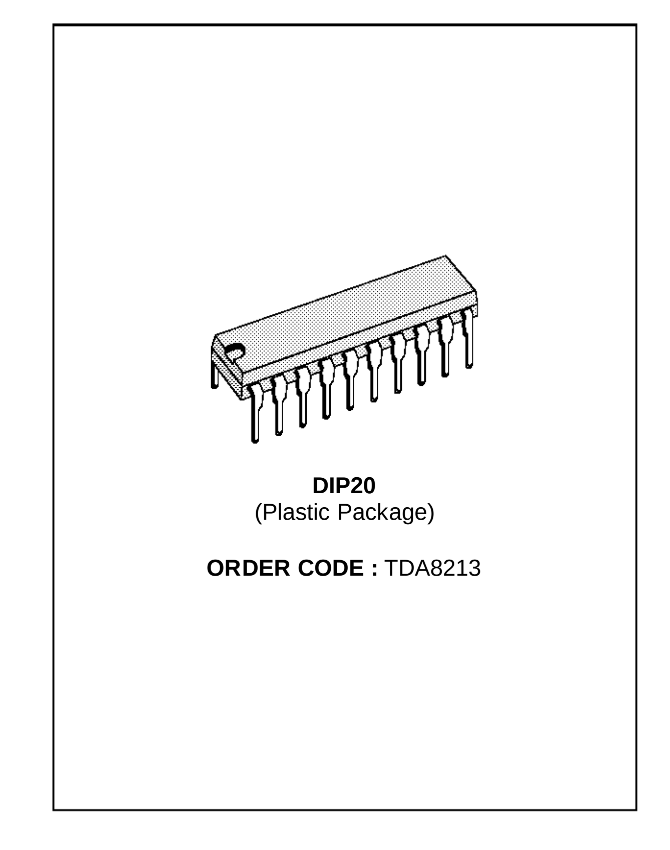


TDA8213

VIDEO & SOUND IF SYSTEM

- VERY LOW CURRENT ABSORPTION
- 3 STAGE IF GAIN CONTROLLED AMPLIFIER
- SYNCHRONOUS VIDEO DEMODULATOR
- WHITE SPOT AND NOISE INVERTER
- AGC CIRCUIT WITH NOISE GATING
- TUNER AGC OUTPUT FOR PNP TUNERS
- FM DETECTOR
- AF AMPLIFIER WITH DC VOLUME CONTROL
- AFC
- 2 V_{PP} ON VIDEO OUTPUT



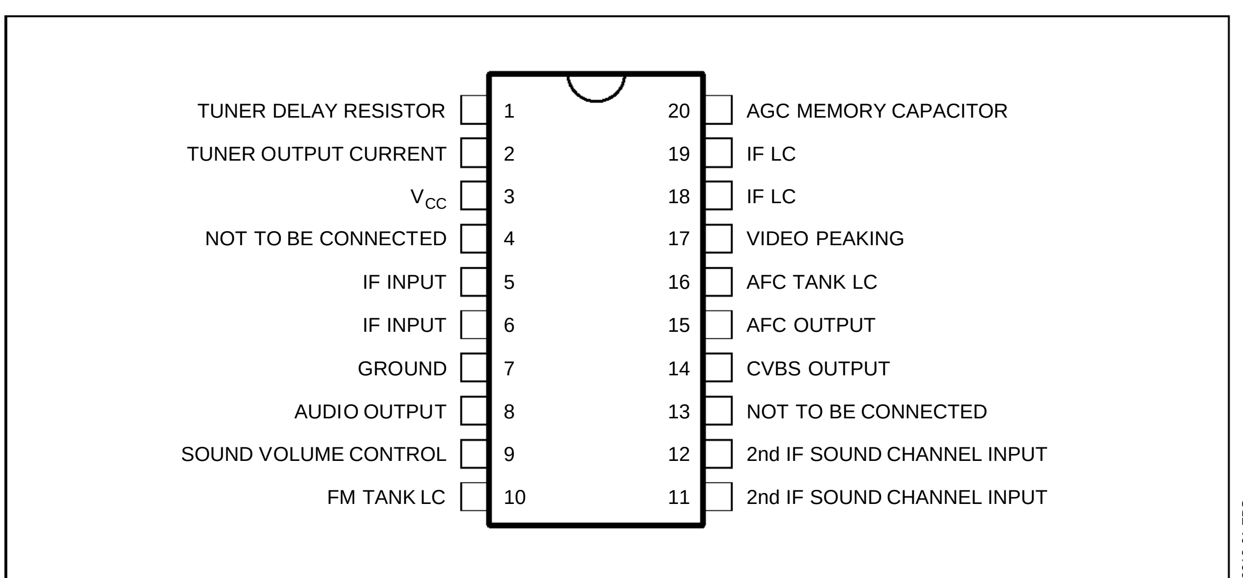
DIP20
(Plastic Package)

ORDER CODE : TDA8213

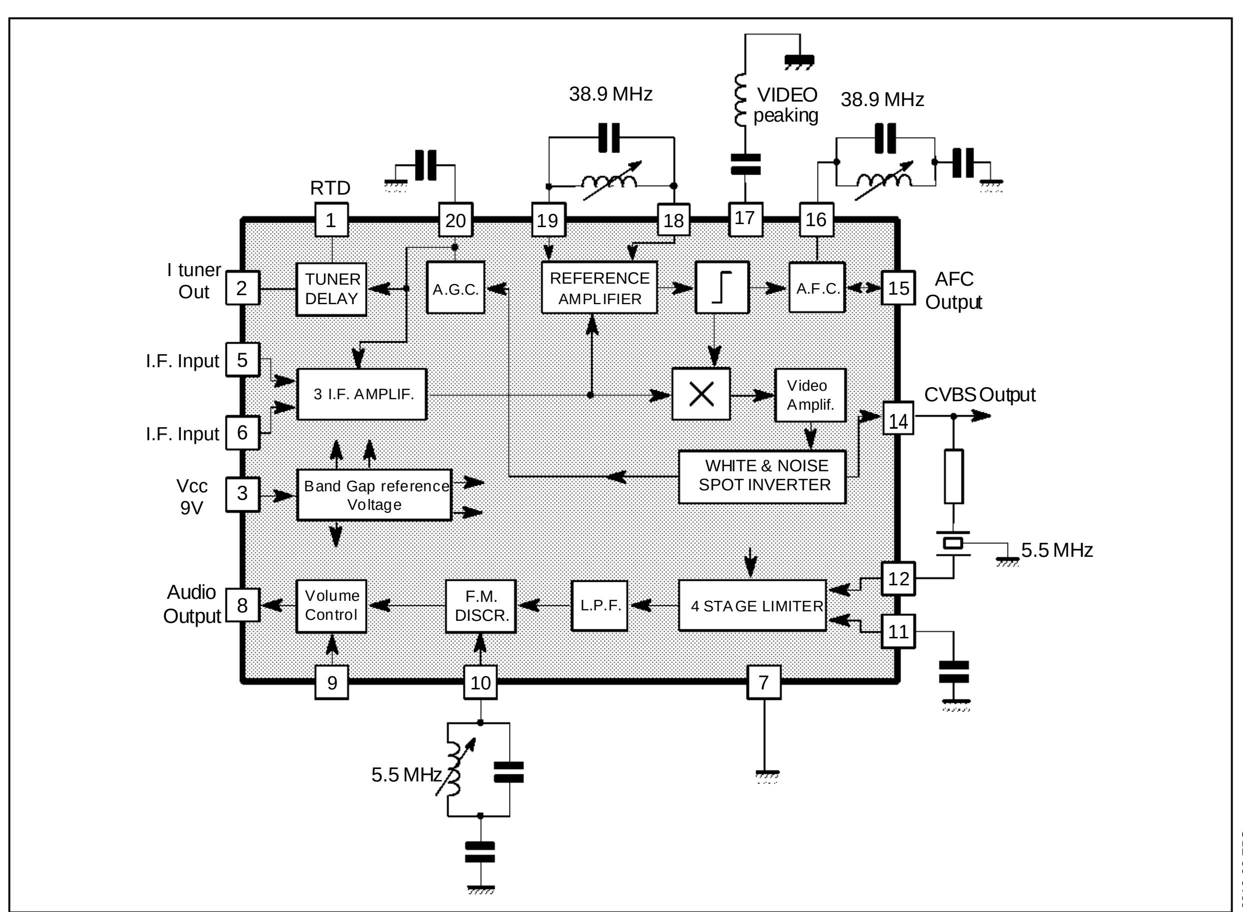
DESCRIPTION

The TDA8213 is a monolithic integrated circuit in DIP20 package for colour and black & white television receivers using PNP tuners. It is intended to operate with a negatively modulated vision carrier and frequency modulated sound carrier. Used with TDA8214/15 (H/V deflection circuit) and TDA8217 (Pal decoder and video processor), this IC permits a complete low-cost solution for PAL applications.

PIN CONNECTIONS



BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_S	Supply voltage	13.5	V
V_X	Tuner AGC voltage	V_S	V
P	Power dissipation at T_{AMB} = 70°C	880	mW
T_{STG}	Storage temperature range	- 40, + 150	°C

8213-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{TH(j-a)}$	Junction-ambient thermal resistance	Max.	80	°C/W

8213-02.TBL

ELECTRICAL CHARACTERISTICS

(T_{amb} = 25°C, V_{CC} = 9V, IF input = 10mV$_{RMS}$ top sync, D = 90%, Video BW = 5MHz,
Sound carrier input : 5.5MHz, 10mV$_{RMS}$, f_m = 1kHz, Audio BW = 20kHz, $\Delta f = \pm$ 25kHz,
Volume attenuation = 0dB, unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
SUPPLY						
	Supply voltage		8	9	12.8	V
	Supply current		14	20	28	mA

8213-03.TBL

ELECTRICAL CHARACTERISTICS

(T_{amb} = 25°C, V_{CC} = 9V, IF input = 10mV$_{RMS}$ top sync, D = 90%, Video BW = 5MHz, Sound carrier input : 5.5MHz, 10mV$_{RMS}$, f_m = 1kHz, Audio BW = 20kHz, Δf = ± 25kHz, Volume attenuation = 0dB, unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
IF AMPLIFIER						
	AGC range		58	64	67	dB
	IF - sensitivity (RMS)	Video out -3dB		70		µV
	R input differential	Guaranteed by process	1	1.5	2	kΩ
	C input Stray				2	pF
DEMODULATED VIDEO OUTPUT						
	S/N video (BW = 5MHz)	IF inp. = 10mV$_{RMS}$, $20 \log_{10} \frac{(WH - BL)}{N_{RMS}}$	49	55		dB
	Intermodulation 1.07MHz	AGC open loop, Picture carrier = 0dB, Chrominance carrier = -3.2dB, Sound carrier = -20dB		50		dB
	Detected video output peak to peak (positive)		1.8	2	2.4	V
	Top synchro output level			1.9		V
	Video Bandwidth with output filter	-3dB, see Figures 1 and 2		7		MHz
	Differential phase			3	7	Degree
	Differential gain			3	7	%
	White noise clamp	Referred to the video output see Figure 6		4.5		V
	White noise insertion			3.2		V
	Video output current capability		1.2	2	2.6	mA
	Residual output carrier (RMS)	At 38.9MHz At 77.8MHz			10 20	mV mV
AFC						
	AFC slope	With R_{Load} = 200kΩ, see Figure 3	25	40	60	mV/kHz
AGC CIRCUIT						
	Maximum I charge		550	900	1200	µA
	Maximum I discharge		14	20	26	µA
	I_{CH} / I_{DISCH} Ratio			45		-
TUNER AGC						
	Sinked Current	Suitable for Mosfet-NCH	1.15	2	2.6	mA
	Slope	RTD = 0 ÷ 10kΩ			600	µA/dB
DEMODULATED AUDIO OUTPUT						
	Detected output audio signal (RMS)		120	270	350	mV
	Total harmonic distorsion			0.5	2	%
	Amplitude modulation rejection	m = 30%	40	53		dB
	2nd IF sound sensitivity -3dB FM detected audio signal (RMS)			200		µV
	$\frac{S + N}{N}$	Δf = ± 25kHz for signal Δf= 0 after deemphasis (BW = 20kHz)l	50	60		dB
	Thermal drift of volume			0.05		$\frac{dB}{^oC}$
	Input resistance limiter		400	560	720	Ω
	Volume Control versus V_9	See Figure 4 V_9 = 4.5V V_9 = 2.5V V_9 = 0.9V	 12 65	0 18 74	 24 	dB dB dB

8213-04.TBL



TEST CIRCUIT

9 V
100nF
220Ω
6.2 Vz
IoT
A
V1TUN
C
B
SW1
2.2kΩ
9VDC
10µH
100Ω
10µF
180Ω
1.8kΩ
Q=80
38.9MHz
100nF
10kΩ
1µF
47pF
38.9 MHz
Q=80
9V
VIF
Input
38.9 MHz
M = 100 %
R = 10 %
AMDSB
10nF
4
200
Ω
4
10 nF
TDA 8213
10nF
100kΩ
47pF
D
AFC
Out
470nF
100kΩ
E
Video
Out 1
AUDIO
SIGNAL
WITHOUT
DEEMPHASIS
L
1kΩ
4.7kΩ
27pF
4.7µH
100pF
100nF
5.5MHz
Q > 40
100nF
47nF
33nF
50Ω
F
Video
Out 2
I
AUDIO OUTPUT
WITH DEEMPHASIS
Volume
control
FM Input
8213-03.EPS

Figure 1 : Output Signal Bandwidth without Video peaking

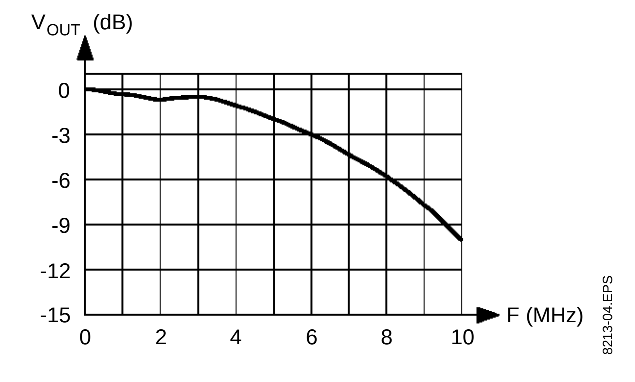


Figure 2 : Output Signal Bandwidth with Video peaking

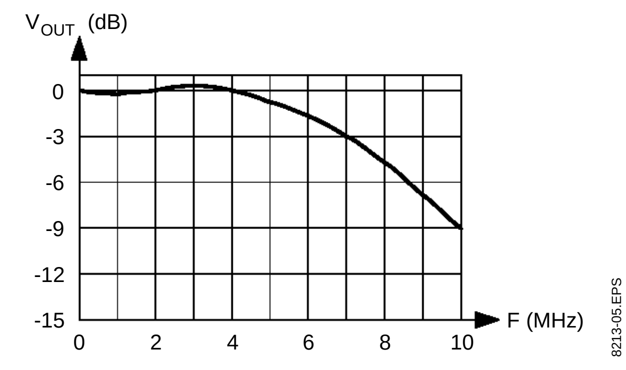


Figure 3 : AFC Voltage versus Input Frequency

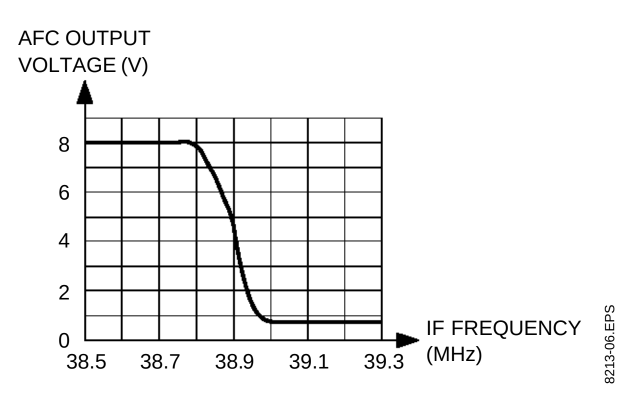


Figure 4 : Volume Control Attenuation versus Voltage in Pin 9

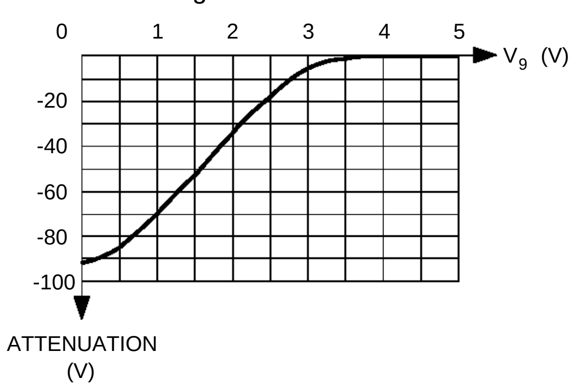


Figure 5 : Typical Connection from µP to TDA8213 for Remote Volume Control (Pin 9)

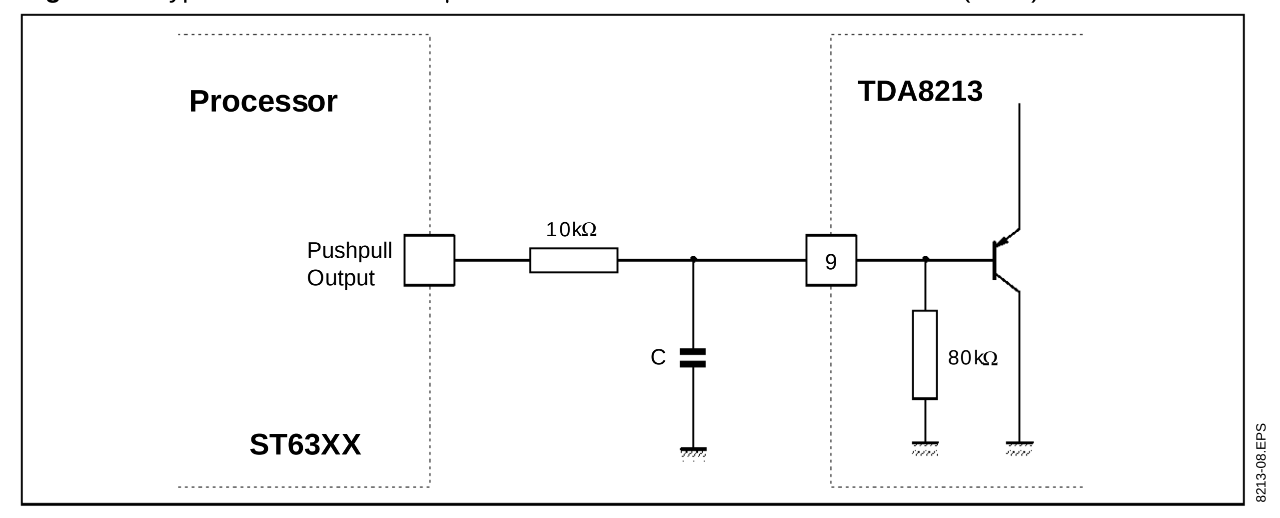


Figure 6 : Black and White Noise Inverter

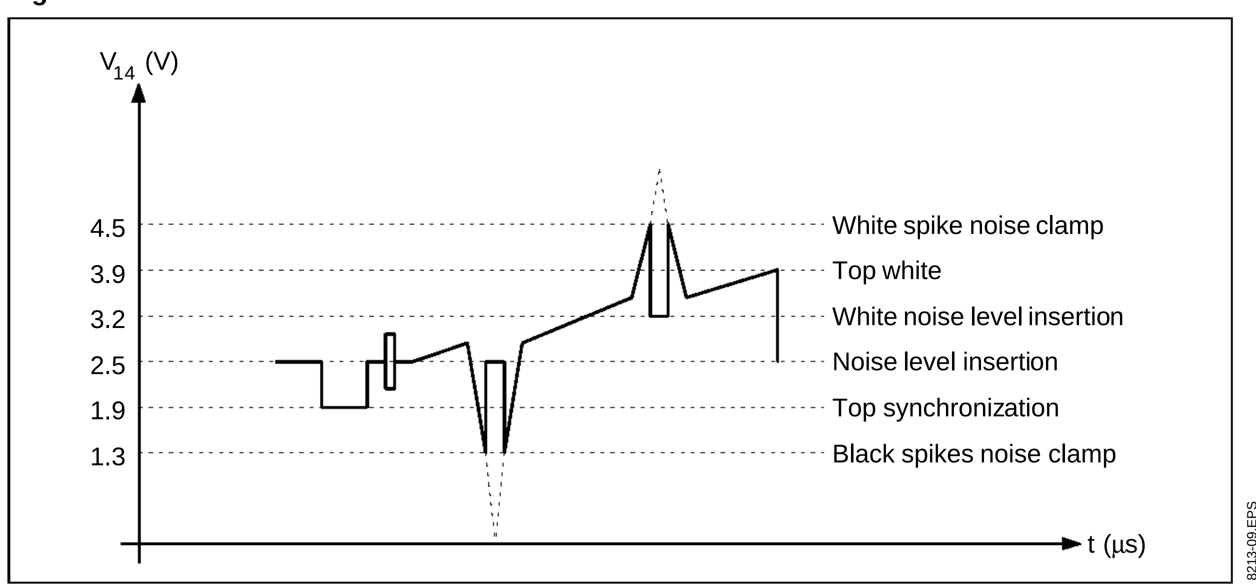
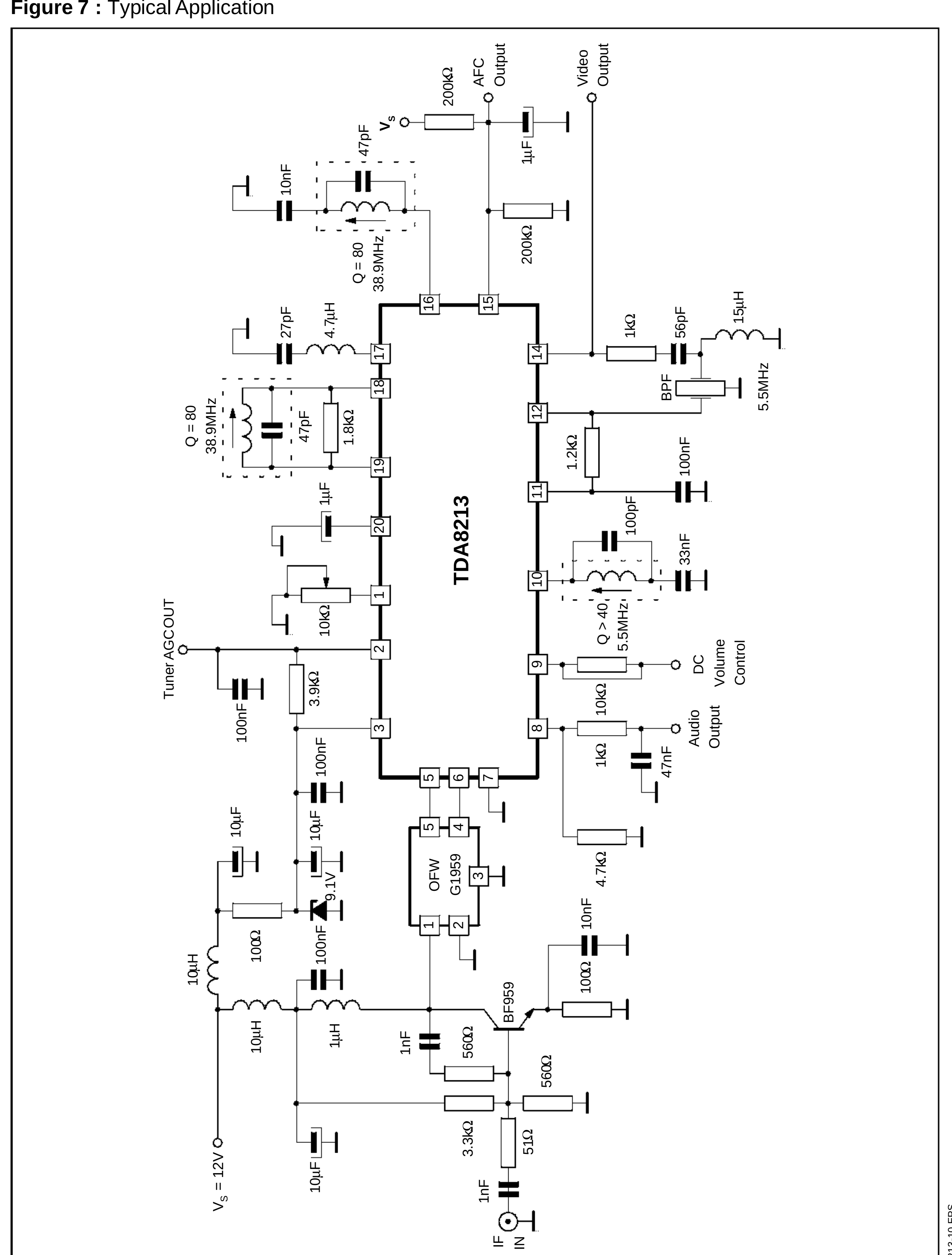
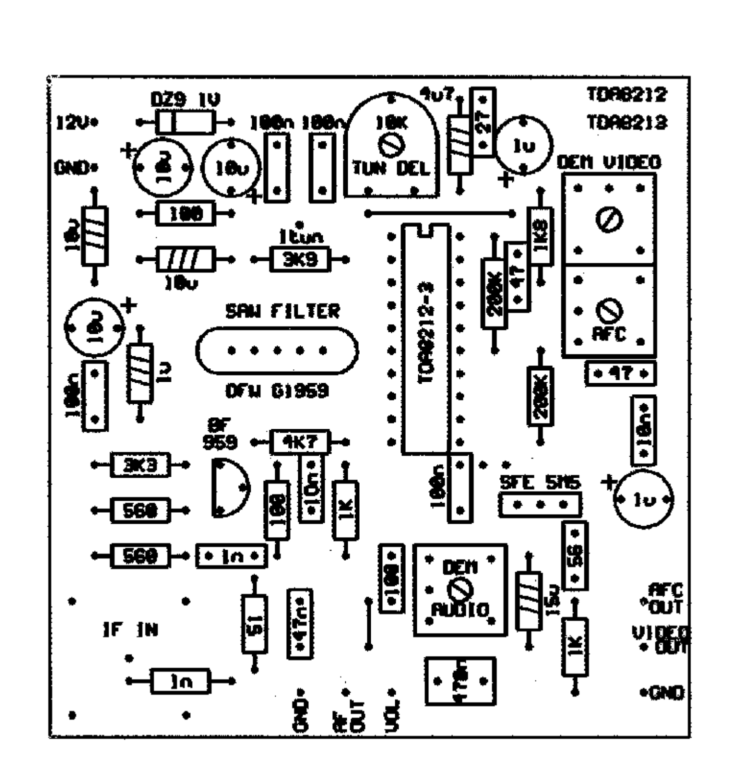


Figure 7 : Typical Application



8213-10.EPS

Figure 8 : PC Board and Components Lay-out of the Circuit of Figure 7 (1 : 1 scale)

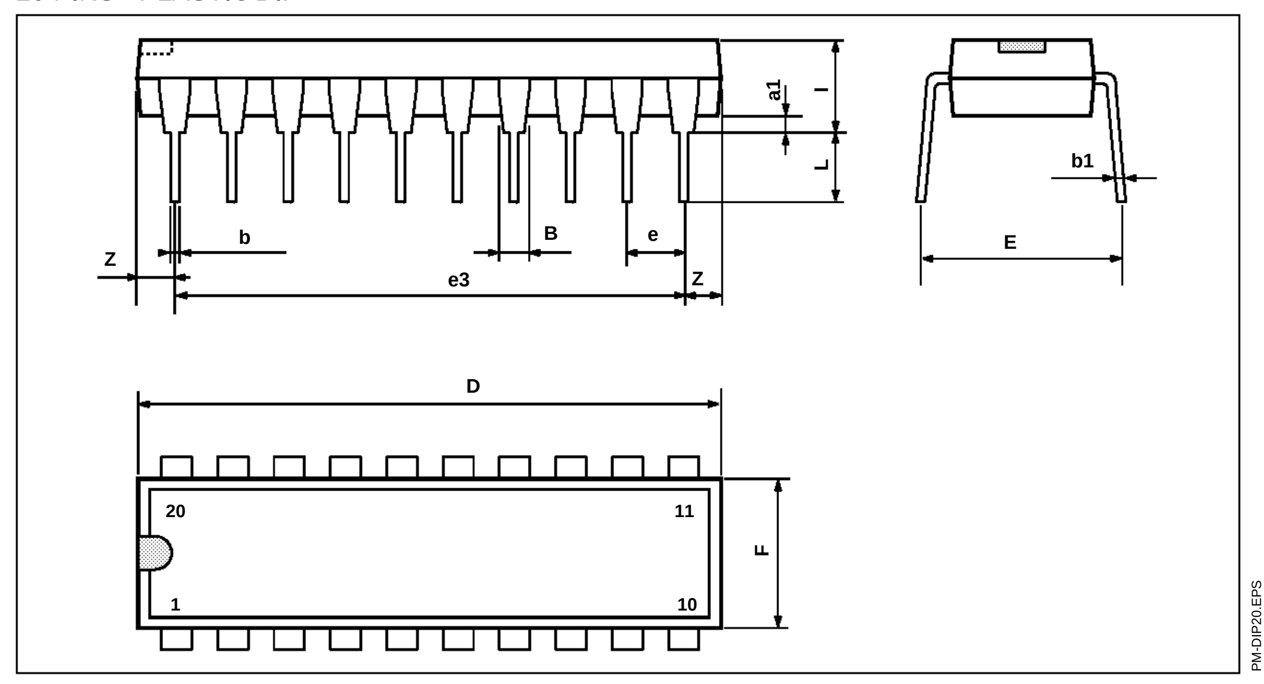




8213-11A.TIF/8213-11B.TIF

PACKAGE MECHANICAL DATA

20 PINS - PLASTIC DIP



Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
a1	0.254			0.010		
B	1.39		1.65	0.055		0.065
b		0.45			0.018	
b1		0.25			0.010	
D			25.4			1.000
E		8.5			0.335	
e		2.54			0.100	
e3		22.86			0.900	
F			7.1			0.280
i			3.93			0.155
L		3.3			0.130	
Z			1.34			0.053

DIP20.TBL